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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,778	09/05/2003	Thomas L. Beck	7193	6594
22922 7590 04/02/2009 REINHART BOERNER VAN DEUREN S.C. ATTN: LINDA KASULKE, DOCKET COORDINATOR 1000 NORTH WATER STREET SUITE 2100 MILWAUKEE, WI 53202				
EXAMINER				
HAMO, PATRICK				
ART UNIT		PAPER NUMBER		
3746				
NOTIFICATION DATE		DELIVERY MODE		
04/02/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPAdmin@reinhardtllaw.com

Office Action Summary

Application No.

10/655,778

Applicant(s)

BECK ET AL.

Examiner

PATRICK HAMO

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 23-91 is/are pending in the application.
- 4a) Of the above claim(s) 1-16, 27-68 and 75-91 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20, 25 and 74 is/are allowed.
- 6) ☒ Claim(s) 17-19, 21, 23, 24, 26, 69-73 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This action is in response to a request for reconsideration filed on 24 December 2008.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17-19, 21, 23, 24, 26 and 69-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birkhead et al., U.S. Pat. No. 6,536,522 in view of Pavlov et al., U.S. Pat. No. 6,683,428.

Birkhead discloses a pump control system for controlling a progressing cavity pump 60 for transferring fluid within a fluid system, the pump control system comprising: a plurality of sensors 80 located at or above ground level; means (controller 25) responsive to the sensors for determining values of torque and speed inputs to the progressing cavity pump; means (also controller 25) for using the values of torque and speed inputs to calculate one or more values representing the performance of the progressing cavity pump (col. 4, ll. 34-64); and means for using the progressing cavity pump performance values to produce one or more command signals for controlling the speed of the progressing cavity pump (col. 4, ll. 49-50), the values of torque and speed

inputs being derived using measured or calculated values without requiring downhole sensors; torque and speed sensor 80 is at the surface);

a method of controlling the progressing cavity pump for transferring fluid within a fluid system, the method comprising the steps of: determining values of torque and speed inputs to the progressing cavity pump (via sensor 80); using the values of torque and speed inputs to calculate one or more values representing the performance of the progressing cavity pump (col. 4, ll. 34-64); using the progressing cavity pump performance values to produce one or more command signals; and using the command signals to control the speed of the progressing cavity pump (col. 4, ll. 49-50), wherein the values of torque and speed inputs are determined using measured or calculated values without requiring downhole sensors (torque and speed sensor 80 is at the surface);

wherein the step of using progressing cavity pump performance values to produce command signals comprises the steps of: selecting a progressing cavity pump performance parameter (pressure, col. 4, ll. 34-36) to control; determining a setpoint (preset or historically stored values, col. 4, ll. 44-48) for the selected progressing cavity pump performance parameter; calculating a control signal using the setpoint value of the selected progressing cavity pump performance parameter (col. 4, ll. 49-50); and calculating the command signals from the control signal;

wherein the progressing cavity pump is coupled to an electric motor and the step of determining the torque and speed inputs to the progressing cavity pump comprises the steps of: measuring the electrical voltages applied to the motor and currents drawn

by the motor; and using the measured values of electrical voltages applied to the motor and currents drawn by the motor to calculate at least one of the values selected from the group consisting of motor torque and motor speed;

Birkhead discloses or teaches all of the limitations substantially as claimed except for the specific limitations pertaining to the means by which the torque and speed are calculated. Birkhead discloses a nominal sensor 80 that measures torque and speed, failing to disclose that the step of determining the torque and speed inputs to the progressing cavity pump comprises the steps of: measuring the electrical voltages applied to the motor and currents drawn by the motor; and using the measured values of electrical voltages applied to the motor and currents drawn by the motor to calculate at least one of the values selected from the group consisting of motor torque and motor speed.

However, Pavlov teaches a control method for a motor including measuring voltages and currents of the motor and using the measured values of voltage and current drawn by the motor to calculate a value for the motor speed and torque (col. 5, ll. 32-38). It would have been obvious to one of ordinary skill in the art to have applied the teachings of Pavlov in determining torque and speed to the nominal sensor of Birkhead in order to achieve the predictable result of determining the torque and speed of a motor.

In regards to claim 19, the combination of Birkhead and Pavlov disclose or teach all of the limitations substantially as claimed except that the performance parameter is the pump flow. However, though not explicitly disclosing that the pump

parameter is pump flow, Birkhead discloses that the parameter is being pressure is adjusted by controlling the pump flow, acknowledging the relationship between pump flow and pressure and implying that pump flow as a parameter would achieve substantially the same objective. Therefore, it would have been obvious to one of ordinary skill in the art to use pump flow as the performance parameter to be set and measured.

In regards to claims 70-72, Birkhead discloses all of the limitations substantially as claimed, notably means for using progressing cavity pump performance values to produce one or more command signals for controlling the speed of the progressing cavity pump (col. 4, ll. 49-50). Birkhead does not explicitly disclose using the progressing cavity pump performance values to produce command signals includes means for calculating a feedback signal indicative of the difference between a current value of a selected progressing cavity pump performance parameter and a setpoint value of the selected progressing cavity pump performance parameter, and means for calculating the command signals from the feedback signal. However, feedback control as described in the claimed limitations above are typical of elementary feedback control systems. It would have been obvious to one of ordinary skill in the art that Birkhead, having sensors to measure actual production values and designed to set setpoint values, would use such feedback control as claimed by the applicant.

Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references applied to claim 69 above in view of Kawabata et al., 6,244,831.

Birkhead discloses all of the limitations substantially as claimed except means using the progressing cavity pump performance values to produce command signals includes means for calculating a feedforward signal by predicting a value of mechanical input to the progressing cavity pump when operating with a selected progressing cavity pump performance value at a setpoint value, and means for calculating the command signals from the feedforward signal.

As discussed above, Birkhead discloses sensors that measure actual performance values and is designed to set setpoint values, lending itself to feedback control. Kawabata teaches a feedforward control method for a pump, identifying a target value that undergoes a subtraction cycle that predicts deviation between a target value and a setpoint value to identify the proper setpoint value (col. 18, ll. 28-55), that would be obvious to one of the art to adapt to the control system of Birkhead to achieve the predictable result of using feedforward control to predict and obviate deviations between setpoint and target values.

Allowable Subject Matter

Claims 20, 25 and 74 are allowed.

Response to Arguments

The examiner acknowledges the amendments made to claims 20, 25 and 74 overlooked in the prior Office action dated 24 July 2008. These amendments put these claims in condition for allowance, as indicated above.

Applicant's arguments filed with respect to the rejection of claims 17-19, 21, 23, 24, 26 and 69-72 as being obvious over Birkhead in view of Pavlov have been fully considered but they are not persuasive.

Addressing each argument in turn, first Applicant argues that the combination fails to teach that "one or more values representing the performance of the progressing cavity pump must be found through calculation from the values of torque and speed inputs to the progressing cavity pump, as calculated from measurements of electrical voltages and currents applied to and drawn by the motor." Contrary to applicant's characterization of the references, Birkhead does teach such a value, for example the over torque applied to the shaft 15 (see Birkhead, col. 5, ll. 20-25).

The second argument follows closely from the first, namely that "one or more command signals be produced" using the values found. Birkhead however discloses not only monitoring the over torque of the shaft, but also correcting it (id.).

The examiner does not rely on Pavlov to teach the use of the torque of the motor as a value, but simply for using the measured values of voltage and current drawn by the motor to calculate a value for the motor speed and torque. Therefore, the combination does not teach away from using the torque to monitor and control a performance parameter of the pump. It is true that Birkhead also discloses the use of pressure sensors, but the claims do not preclude this, as long as the torque measurements also measure and control a parameter.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Charles G Freay/
Primary Examiner, Art Unit 3746

/Patrick Hamo/
Patent Examiner, AU 3746